



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/765,813

01/27/2004

Lakshmanan Ramakrishnan

15142US02

2449

23446 7590 09/21/2009
MCANDREWS HELD & MALLOY, LTD
500 WEST MADISON STREET
SUITE 3400
CHICAGO, IL 60661

EXAMINER

WERNER, DAVID N

ART UNIT

PAPER NUMBER

2621

MAIL DATE

DELIVERY MODE

09/21/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/765,813	Applicant(s) RAMAKRISHNAN, LAKSHMANAN	
	Examiner David N. Werner	Art Unit 2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 April 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-12 and 20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-12 and 20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 December 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This Office action for U.S. Patent Application 10/765,813 is responsive to communications filed 22 April 2009, in response to the Final Rejection of 22 January 2009.

2. In view of the Pre-Appeal Brief Conference Request filed on 22 April 2009 and the Appeal Conference of 23 June 2009, PROSECUTION IS HEREBY REOPENED. New grounds of rejection are set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below:

/Mehrdad Dastouri/

Supervisory Patent Examiner, Art Unit 2621.

Response to Arguments

3. Applicant's arguments, see pages 2–4, filed 22 April 2009, with respect to the rejection(s) of claim(s) 9–12 and 20 under 35 U.S.C. 102(e) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of U.S. Patent Application Publication 2002/0080870 A1 (Piazza et al.) and U.S. Patent 6,542,541 B1 (Luna et al.).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 9–12 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication 2002/0080870 A1 (Piazza et al.) in view of U.S. Patent 6,542,541 B1 (Luna et al.). Piazza et al. teaches a video decoder with motion compensation. Regarding Claim 9, Figure 8 illustrates a block diagram of the decoder. Included is memory 830 storing compressed macroblock 880 (paragraph 0065). The compressed macroblock is then loaded into cache memory 810 (paragraph 0066). Cache memory 810 is the claimed "local buffer". Processor 800 then processes the data in cache memory 810 and performs decoding operations such as inverse DCT

Art Unit: 2621

(paragraph 0067). Then, Processor 800 is the claimed "decompression engine". However, the present invention differs from Piazza et al. in that the present invention discloses an extractor for direct memory access engine control of the local buffer, giving instructions that the compressed data stored in the buffer may be overwritten by more compressed video data¹.

Luna et al. teaches an MPEG decoding system. Regarding Claim 9, in Luna et al., Figure 2A illustrates the decoder, and figure 8 illustrates a flowchart of memory operations in the decoder. In Luna et al., processor 20 includes VLIW processor 21 that controls the DMA transfer units 27, 31, 38, and 39 and cache 22 (column 5: line 46–column 6: line 43). For example, at step 803A, VLIW 21 sends a "GO" command allowing a VLD to decode a macroblock, and waits for a "continue" command from the VLD to DMA transfer unit DS1 31 to load data into buffer element MB_B1' (column 11: lines 9–23). Many processing steps are performed on the data stored in MB_B1', but the data remains as-is in MB_B1' (column 14: lines 25–30) until step S809G, when data for a new macroblock overwrite the data in MB_B1' (column 15: lines 19–21). As in the first transfer, VLIW processor 21 initiates this overwriting transfer with a "GO" command, which starts VLD 24 decoding MB6 data and to send a "continue" command which allows DS131 to transfer data from external buffer B1 to the cache buffer (column

¹ It is noted that in the Piazza et al. decoder, only compressed macroblocks are stored in cache memory 810. Decompressed, decoded macroblocks are stored in a different buffer: memory buffer 820 (paragraphs 0067–0068). Then, it cannot be said that cache 810 overwrites compressed data with decompressed data, as in the previously-cited MacInnis reference, as discussed in the pre-appeal brief conference. Since Cache memory 810 has finite capacity, it is inherent that some compressed macroblock data stored in it will eventually be overwritten with new compressed macroblock data as the decoder continues to run over time. Piazza et al. also implies that cache memory 810 only has the capacity to store one compressed macroblock at a time.

Art Unit: 2621

14: line 66–column 15: line 3). Then, VLIW processor 21 of Luna et al. is the claimed "extractor", and the "GO" or "continue" command is the claimed indicator allowing a DMA to overwrite cache data.

Piazza et al. discloses the claimed invention except for details of memory control. Luna et al. teaches that it was known to use DMA to control when data in a local macroblock cache memory may be overwritten. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the present invention to modify the system of Piazza et al. to control cache memory 810 for storing a compressed macroblock with the VLIW and DMA transfer of Luna et al., as Luna et al. controls a cache that stores a decoded macroblock, since Luna et al. states in column 4: lines 1–19 that such a modification would increase decoding speed by reducing memory overhead delays.

Regarding Claim 10, in Piazza et al., a macroblock command to data stored in cache memory 810 (paragraph 0087) is the claimed command.

Regarding Claim 11, in Piazza et al., assuming only one macroblock 880 is in cache memory 810 at once, a second macroblock 880 after a first macroblock 880 is processed and stored in memory buffer 820 is the claimed "another portion of the compressed video data". In Luna et al., MB6 data that replaces MB1 data in the cache buffer is another portion of video data stored in a local buffer.

Regarding Claim 12, Luna et al. illustrates parallel processing of macroblocks, with all buffers at least doubled (column 6: lines 2, 44–53).

Regarding Independent Claim 20, as discussed above, in Piazza et al., processor 800 is the claimed video decoder and cache 810 is the claimed local buffer. In Luna et al., VLIW processor 21 is the claimed extractor, and DMA transfer unit 27, 31, 38, or 39 is the claimed "direct memory access engine".

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent 5,774,206 A (Wasserman et al.) teaches an MPEG decoder on an ASIC that includes DMA controllers to control data between a decoder core and external memory. U.S. Patent 6,460,097 B1 (Harumoto et al.) teaches a video output apparatus that uses a DMA transfer to output data to a terminal. U.S. Patent 6,462,744 B1 (Mochida et al.) teaches a decoder that has a special memory reserve for macroblocks corresponding with an area reserved for overlay of graphical data not in the original source video but added at the decoder side.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David N. Werner whose telephone number is (571)272-9662. The examiner can normally be reached on Monday-Friday from 10:00-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri can be reached on (571) 272-7418. The fax phone

Art Unit: 2621

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. N. W./
Examiner, Art Unit 2621

/Mehrdad Dastouri/
Supervisory Patent Examiner, Art Unit 2621